

Claims

1. A bearing device comprising a plurality of raceway members which perform relative motion, wherein

5 a lubricant supply unit body which supplies lubricant as necessary is additionally disposed between opposed faces of said raceway members, and said lubricant supply unit body comprises a pump which discharges the lubricant, and a driving portion which drives said pump.

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2. A bearing device according to claim 1, wherein said driving portion for said pump is an electric generator having a power generating capacity according to the rotational speed of a bearing, and an amount of lubricant discharged
15 by said pump is controlled in accordance with the power generating capacity of said electric generator.

3. A bearing device according to claim 1, wherein said driving portion for said pump is a battery.

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4. A bearing device according to claim 3, wherein said battery is a fuel cell.

5. A bearing device according to claim 4, wherein said lubricant supply unit body comprises storing means from which
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hydrogen for said fuel cell can be taken out.

6. A bearing device according to any one of claims 1 to 5,
wherein said lubricant supply unit body comprises a lubri-
5 cant storing tank.

7. A bearing device according to any one of claims 1 to 6,
wherein said plurality of raceway members and said lubri-
cant supply unit body have a ring-like shape and are dis-
10 posed coaxially.

8. A bearing device according to claim 7, wherein said
bearing device is a rolling bearing in which said plurality
of raceway members are an inner ring and an outer ring, and
15 which comprises a plurality of rolling elements between
said rings.

9. A bearing device according to any one of claims 1 to 8,
wherein said lubricant supply unit body comprises a sensor
20 which detects a lubrication condition between said opposed
faces of said plurality of raceway members, and said pump
is functionally controlled based on a detection output from
said sensor.

25 10. A bearing device according to any one of claims 7 to 9,

wherein said lubricant supply unit body is detachably attached to a vicinity of a shoulder portion of a circumferential face of a stationary raceway member which is opposed to a rotating raceway member.

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11. A bearing device according to any one of claims 7 to 10, wherein said raceway member is a bearing comprising: outer and inner rings each having a raceway surface; rolling elements and a seal ring which are disposed between
10 said rings, and at least said pump, said driving portion for said pump, and said lubricant storing tank are formed in a unit as said lubricant supply unit body, and said lubricant supply unit body is detachably attached to a vicinity of a shoulder portion of an inner circumferential face
15 of said outer ring or an outer circumferential face of said inner ring, or to an inner side face of said seal ring.

12. A bearing device according to any one of claims 1 to 11, wherein said pump is a diaphragm pump comprising a piezo-
20 zoelectric element and a diaphragm which is displaced in a reciprocating manner by said piezoelectric element.

13. A bearing device according to claim 12, wherein said pump comprises a miniature motor, in place of said piezo-
25 electric element.

14. A bearing device according to any one of claims 11 to 13, wherein said lubricant storing tank is detachably attached to an outer face of said seal ring, and said driving
5 portion and said pump are additionally disposed on an inner face of said seal ring.

15. A bearing device according to any one of claims 9 to 14, wherein said sensor is a temperature sensor, said tem-
10 perature sensor is attached to a vicinity of raceway portions of said raceway members, and an amount of lubricant discharged by said pump is controlled by controlling means based on a detection output of said temperature sensor.

15 16. A bearing device according to any one of claims 9 to 15, wherein relationships between an output value of said sensor and a lubrication condition are previously obtained, the lubrication condition is predicted from a measured
20 value of said sensor, and said pump is controlled in accordance with a result of the prediction.